

JC18 Rec'd PCT/PTO 05 APR 2002

FORM PTO-1390 (REV. 11-2000)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	ATTORNEY'S DOCKET NUMBER  0104-0390P
<b>TRANSMITTAL LETTER TO THE UNITED STATES          DESIGNATED/ELECTED OFFICE (DO/EO/US)          CONCERNING A FILING UNDER 35 U.S.C. 371</b>			U.S. APPLICATION NO. (If known, see 37 CFR 1.5) : <b>10/089864</b>
INTERNATIONAL APPLICATION NO.  PCT/SE00/01944	INTERNATIONAL FILING DATE  October 6, 2000	PRIORITY DATE CLAIMED  October 6, 1999	
TITLE OF INVENTION  IMPLANT			
APPLICANT(S) FOR DO/EO/US REKTSSON, Toms; JACOBSSON, Mangus; CARLSSON, Lars; MACDONALD, Warren; WENNBORG, Stig			
Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:			
1. <input checked="" type="checkbox"/> This is a <b>FIRST</b> submission of items concerning a filing under 35 U.S.C. 371. 2. <input type="checkbox"/> This is a <b>SECOND</b> or <b>SUBSEQUENT</b> submission of items concerning a filing under 35 U.S.C. 371. 3. <input checked="" type="checkbox"/> This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39 (1). 4. <input checked="" type="checkbox"/> The US has been elected by the expiration of 19 months from the priority date (Article 31). 5. <input checked="" type="checkbox"/> A copy of the International Application as filed (35 U.S.C. 371(c)(2)) a. <input checked="" type="checkbox"/> is transmitted herewith (required only if not transmitted by the International Bureau). WO 01/24737 b. <input checked="" type="checkbox"/> has been transmitted by the International Bureau. c. <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US). 6. <input type="checkbox"/> An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)). a. <input type="checkbox"/> is transmitted herewith. b. <input type="checkbox"/> has been previously submitted under 35 U.S.C. 154(d)(4) 7. <input checked="" type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3)). a. <input type="checkbox"/> are transmitted herewith (required only if not transmitted by the International Bureau). b. <input type="checkbox"/> have been transmitted by the International Bureau. c. <input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired. d. <input checked="" type="checkbox"/> have not been made and will not be made. 8. <input type="checkbox"/> An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)). 9. <input type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)). 10. <input type="checkbox"/> An English language translation of the annexes of the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).			
<b>Items 11. to 20. below concern document(s) or information included:</b>			
11. <input checked="" type="checkbox"/> An Information Disclosure Statement under 37 CFR 1.97 and 1.98, Form PTO-1449(s), and International Search Report (PCT/ISA/210) with 4 cited document(s). 12. <input type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included. 13. <input checked="" type="checkbox"/> A <b>FIRST</b> preliminary amendment. 14. <input type="checkbox"/> A <b>SECOND</b> or <b>SUBSEQUENT</b> preliminary amendment. 15. <input type="checkbox"/> A substitute specification. 16. <input type="checkbox"/> A change of power of attorney and/or address letter. 17. <input type="checkbox"/> A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821-1.825. 18. <input type="checkbox"/> A second copy of the published international application under 35 U.S.C. 154(d)(4). 19. <input type="checkbox"/> A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4). 20. <input checked="" type="checkbox"/> Other items or information: 1.) PCT/IB/308 2.) PCT/IPEA/409 3.) Four (4) sheets of Formal Drawings			

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PATENT  
0104-0390P

IN THE U.S. PATENT AND TRADEMARK OFFICE

Applicant: ALBREKTSSON, Tomas et al.  
Int'l. Appl. No.: PCT/SE00/01944  
Appl. No.: 10/089,864 Group:  
Filed: April 5, 2002 Examiner:  
For: IMPLANT

**PRELIMINARY AMENDMENT**

**BOX PATENT APPLICATION**

Assistant Commissioner for Patents  
Washington, DC 20231

May 31, 2002

Sir:

The following Preliminary Amendments and Remarks are respectfully submitted  
in connection with the above-identified application.

**IN THE CLAIMS:**

Please amend the claim as follows:

53. (AMENDED) An implant as claimed in claim 48, wherein the heights of the  
screw thread profiles of said first and second cylindrical sections and said connecting  
section are essentially the same.

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Appl. No. 10/089,864  
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## REMARKS

Claims 36-70 are now present in the application. Claim 53 has been amended.

Claim 36 is independent.

Favorable action on the above-identified application is respectfully requested.

In the event there are any matters remaining in this application, the Examiner is invited to contact Paul C. Lewis, Registration No. 43,368 at (703) 205-8000 in the Washington, D.C. area.

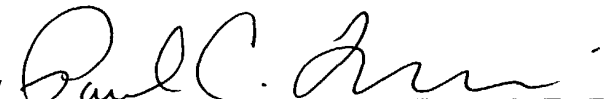
Attached hereto is a marked-up version of the changes made to the application by this Amendment.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

BIRCH, STEWART, KOLASCH & BIRCH, LLP

By



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0104-0390P

Attachment: Version With Markings To Show Changes Made

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**VERSION WITH MARKINGS TO SHOW CHANGES MADE**

**IN THE CLAIMS:**

**The claim has been amended as follows:**

53. (AMENDED) An implant as claimed in claim [17] 48, wherein the heights of the screw thread profiles of said first and second cylindrical sections and said connecting section are essentially the same.

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PATENT  
0104-0390P

## IN THE U.S. PATENT AND TRADEMARK OFFICE

Applicant: ALBREKTSSON, Tomas et al.  
Int'l. Appl. No.: PCT/SE00/01944  
Appl. No.: New Group:  
Filed: April 5, 2002 Examiner:  
For: IMPLANT

PRELIMINARY AMENDMENT**BOX PATENT APPLICATION**

Assistant Commissioner for Patents  
Washington, DC 20231

April 5, 2002

Sir:

The following Preliminary Amendments and Remarks are respectfully submitted in connection with the above-identified application.

**AMENDMENTS****IN THE SPECIFICATION:**

Please amend the specification as follows:

Before line 1, insert --This application is the national phase under 35 U.S.C. § 371 of PCT International Application No. PCT/SE00/01944 which has an International filing date of October 6, 2000, which designated the United States of America.--

Docket No. 0104-0390P

**IN THE CLAIMS:**

Please cancel claims 1 through 35 without prejudice or disclaimer to the subject matter contained therein and substitute therefore the following new claims:

--36. (New) An implant for insertion into and permanent anchorage in bone tissue, comprising an intraosseous anchoring structure of a generally circular cross-section, said anchoring structure comprising a first cylindrical section of a first diameter and a second cylindrical section of a second diameter, said second diameter being less than said first diameter, said first and second cylindrical sections each being provided with a screw thread profile, characterized in that said anchoring structure comprises a tapered connecting section provided between and interconnecting said first and second cylindrical sections.

37. (New) An implant as claimed in claim 36, wherein the implant is a fixture of an orthopedic prosthesis.

38. (New) An implant as claimed in claim 37, wherein the implant is a femur fixture of a hip-joint prosthesis.

39. (Amended) An implant as claimed in claim 36, wherein said connecting section has a frusto-conical shape.





Docket No. 0104-0390P

46. (New) An implant as claimed in claim 45, wherein said circumferential beads has a height less than that of the screw thread profiles of said first and second cylindrical sections.

47. (New) An implant as claimed in claim 46, wherein the height of said circumferential beads is no greater than 0.3 mm.

48. (New) An implant as claimed in claim 44, wherein said circumferentially oriented roughness is in the shape of a screw thread profile.

49. (New) An implant as claimed in claim 48, wherein the screw thread profile of said connecting section differs from the screw thread profiles of said first and second cylindrical sections.

50. (New) An implant as claimed in claim 49, wherein the screw thread profile of said connecting section has a height less than that of the screw thread profile of said first and second cylindrical sections.

51. (New) An implant as claimed in claim 50, wherein the screw thread profile of said connecting section is in the form of microthreads.

53. (New) An implant as claimed in claim 17, wherein the heights of the screw thread profiles of said first and second cylindrical sections and said connecting section are essentially the same.

54. (New) An implant as claimed in claim 36, wherein said connecting section is at least partly provided with a smooth surface.

55. (New) An implant as claimed in claim 36, wherein the entire surface of said connecting section is smooth.

56. (New) An implant as claimed in claim 36, wherein one or more self-tapping cutting recesses are provided at least in part on said connecting section.

57. (New) An implant as claimed in claim 36, wherein said implant comprises a head section, and wherein said anchoring structure comprises a tapered proximal section being provided between and interconnecting said first cylindrical section and said head section.

64. (New) An implant as claimed in claim 62, wherein the height of said circumferentially oriented roughness is no greater than 0.3mm.

70. (New) An implant as claimed in claim 69, wherein said circular beads have a height in the range of 0.1-0.5mm.

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**REMARKS**

The specification has been amended to provide a cross-reference to the previously filed International Application.

Entry of the above amendments is earnestly solicited. An early and favorable first action on the merits is earnestly solicited.

Attached hereto is a marked-up version of the changes made to the application by this amendment.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

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Attachment: VERSION WITH MARKINGS TO SHOW CHANGES MADE

(Rev. 02/21/02)

Docket No. 0104-0390P

VERSION WITH MARKINGS TO SHOW CHANGES MADE

Claims 1 through 35 have been canceled.

Claims 36 through 70 have been added.

(Rev. 11/13/01)

4/ppts

IMPLANTField of the Invention

The present invention relates to an implant for insertion into and permanent anchorage in human skeletal or bone tissue. More specifically, the invention concerns an implant having a screw-threaded anchoring structure comprising a first cylindrical section of a first diameter and a second cylindrical section of a second diameter, said second diameter being less than said first diameter.

The invention is particularly, although not exclusively, concerned with an implant of this type which takes the form of a femur fixture for a hip-joint prosthesis.

Background of the Invention

Implants of this type in the form of femur fixtures for a hip-joint prosthesis are known from Applicant's prior International patent application publications WO93/01769, WO93/16663 and WO97/25939 with the first and second cylindrical sections being provided with external screw threads for engaging the bone tissue of the femur. The screw threaded first and second cylindrical sections of the femur fixture disclosed in WO93/01769 are assembled together in the femur by firstly inserting the second cylindrical section medially into the neck of the femur from beneath the greater trochanter and then inserting the first cylindrical section into the neck laterally through the resected section left after resection of the head of the femur. The screw threaded first and second cylindrical sections of the femur fixture disclosed in WO93/16663 and WO97/25939, on the other hand, are integrally formed or pre-assembled prior to anchorage of the fixture in the femur neck by screwing the fixture into the femur neck laterally through the resected section left after resection of the femur head.

In the femur fixtures disclosed in WO93/01769, WO93/16663 and WO97/25939, the first cylindrical section steps into the second cylindrical section. A drawback of this type of implant is the amount of stress present between the bone and the implant following implantation.

#### Summary of the Invention

Thus, the object of the present invention is to provide an implant where the above mentioned drawback is reduced.

This and other objects are achieved according to the present invention by providing an implant having the features defined in the independent claim. Preferred embodiments are defined in the dependent claims.

According to the present invention there is provided an implant for insertion into and permanent anchorage in bone tissue, comprising an intraosseous anchoring structure of a generally circular cross-section, said anchoring structure comprising a first cylindrical section of a first diameter and a second cylindrical section of a second diameter, said second diameter being less than said first diameter, said first and second cylindrical sections each being provided with a screw thread profile. The implant is characterised in that said anchoring structure comprises a tapered connecting section provided between and interconnecting said first and second cylindrical sections.

The implant of the invention may be an orthopaedic implant, for example a femur fixture for a hip-joint prosthesis as in the embodiment hereinafter to be described.

Thus, the present invention is based on the advantageous idea of providing an implant of the above-mentioned type with a tapered connecting section between the first and second screw-threaded, cylindrical sections.

The provision of a tapered connecting section would overcome the drawback mentioned above and provide a num-



ber of additional advantages. First, the stresses induced by the sharp, step-wise transition present in the prior art implants between the cylindrical sections of differing diameters is radically reduced using the tapered connecting section of the present invention.

A further advantage resulting from the provision of a tapered connecting section when the implant is used for implantation in a cavity of corresponding shape formed in bone tissue, is that the insertion of the implant is facilitated. This is because the distal end of the implant can be guided by the tapered section of the cavity which is arranged for interacting with the tapered connecting section. Thus, the cavity will have no surface facing directly opposite the insertion direction of the implant, as is the case with the prior art implants (see item 50 of Fig. 5 in WO 97/25939).

A still further advantage is that the provision of a tapered connecting section provides a wedging effect during implantation of the implant into bone tissue. This wedging effect improves the short and long term stability of the implant following said implantation. This is mainly due to the radial force component of the normal contact force between the implant and the cancellous bone tissue that surrounds the connecting section upon implantation.

If the longitudinal force exerted by the surrounding tissue on the implant of the invention and on the above-mentioned prior art implants, following implantation of the implant, is essentially the same, then the transversal force on the implant of the invention will be greater compared to the prior art stepped implants. This is because the longitudinal force is carried by the inclined surface of the tapered connecting section, whereby the resulting transversal force will have a radial force component. This radial force component is not present in the prior art implants since only the radial end portion (e.g. item 10 of Fig. 1 in WO 97/25939) of the proximal



Other differences in screw thread profiles are also conceivable, such as the screw thread profile of the con-



threads is preferably no greater than 0.3 mm, more preferably in the range of 0.1-0.25 mm, and even more preferably approximately 0.2 mm.

Preferably, said beads or screw threads engage with  
5 the cortex 34 of the femur neck at the resected surface. As a result, a stronger short term anchorage of the implant is provided. Also, a stronger long term anchorage is provided due to the improved osseointegration between the tapered proximal section and the surrounding bone  
10 tissue.

According to embodiments of the present invention, the above-mentioned head section is provided with a collar abutting the tapered proximal section, which collar delimits the insertion of the implant into bone tissue.  
15 Preferably, the surface of the collar facing the proximal section is inclined inwardly so as to mate with a resected bone tissue surface that has been given a correspondingly inclined shape. Preferably, the angle of inclination is within the range of 10°-20°, preferably approximately 15°. Alternatively, the surface of the collar  
20 facing the proximal section is given a concave shape, so as to mate with a convex bone tissue surface. Thereby, an improved contact between the implant and the bone surface can be obtained.

Preferably, said collar surface is provided with radially spaced circular beads or grooves for increasing the stability of the inserted implant and promote the osseointegration between the implant and the bone tissue. Preferably, these beads have a height in the range of  
30 0.1-0.5 mm, preferably in the range of 0.2-0.4 mm, and even more preferably approximately 0.3 mm.

By way of example, an embodiment of the invention will now be described with reference to the accompanying Figures of drawings.

Brief Description of the Drawings

Fig. 1 is a perspective view of a femur fixture for a hip-joint prosthesis in accordance with an embodiment of the invention,

5 Fig. 2 is an opposite perspective view of the femur fixture shown in Fig. 1,

Fig. 3 is a longitudinal side view of the femur fixture,

10 Fig. 4 is a longitudinal sectional view of the femur fixture,

Fig. 5 is an enlarged fragmentary sectional view showing the tapered proximal section and the head of the femur fixture,

Fig. 6 is a bottom view of the femur fixture,

15 Fig. 7 is a fragmentary sectional view of the collum of the human femur, with a cavity formed therein for reception of the femur fixture, and

20 Fig. 8 is a fragmentary sectional view of the collum of the human femur, with the femur fixture inserted therein.

Description of Exemplary Embodiment

With reference to Figs 1-8, there is shown an integrally formed femur fixture 1 for a hip-joint prosthesis, preferably made from commercially pure titanium and consisting of (i) an intraosseous anchoring section 3 of circular cross-section, and (ii) a head section 5. The anchoring section 3 is intended for insertion laterally into a cavity 30 of complementary profile (Fig. 7), said cavity 30 being drilled into the neck of a femur through a resected section 33 made by resection of the head of the femur. The head section 5 of the fixture, which will protrude from the resected section 33 when the intraosseous anchoring section 3 is located in the cavity 30 (Fig. 8), is arranged for supporting a ball 25 of the hip-joint prosthesis which interacts with the anatomical acetabular cavity or an acetabular part of the hip-joint







lindrical section 13 is approximately 11 mm, or within the range of 10-12 mm.

The frusto-conical connecting section 15 interconnects the proximal and distal cylindrical sections 11, 13 to one another. In this embodiment, the diameters at the respective end of the connecting section 15 correspond to the diameters of the proximal and distal cylindrical sections 11, 13, respectively. In other words, the distal end of the connecting section 15 has essentially the same diameter as the distal cylindrical section 13, and the proximal end of the connecting section 15 has essentially the same diameter as the proximal cylindrical section 11.

As a result of the fact that the diameter of the proximal cylindrical section 11 can be varied between different femur fixtures, while the diameter of the distal cylindrical section 13 is not varied, the dimensions of the connecting section will be varied in accordance with the varying difference in diameter between the proximal cylindrical section 11 and the distal cylindrical section 13. Since the axial extent of the connecting section is kept relatively short, i.e. within the range of approximately 7.5-10.5 mm, the flank angle of the connecting section can vary from approximately 20° for the narrowest fixture alternative, up to approximately 37° for the widest fixture alternative.

In the herein described embodiment of the invention, the surface of the frusto-conical connecting section 15 is provided with a grit-blasted surface for promoting the osseointegration between the surface and the surrounding cancellous bone tissue. The surface could also, or alternatively, be provided with a screw thread profile for promoting said osseointegration and improve the anchorage of the femur fixture 1. As a further alternative, the frusto-conical connecting section 15 may be left smooth, even polished.

As can be seen in figs 2 and 3, bridging the boundary between the proximal cylindrical section 11 and the

frusto-conical connecting section 15 are a series of equi-spaced, circumferentially-arranged, sharp-edged cutting recesses or notches 14 for self-tapping into a pre-cut outer bone cavity section 32. The cutting recesses 14 each communicate with a channel 16 in the proximal cylindrical section 11 for autologous transplantation of the bone cut by the cutting recesses 14 as the femur fixture 1 is screwed into the bore in the femur neck, as detailed in WO97/25939.

Further, bridging the boundary between the distal cylindrical section 13 and the tapered terminal distal section 12 are also a series of short, sharp-edged circumferentially-arranged cutting recesses 17 for the distal cylindrical section 13 to be self-tapped into said drilled, relatively narrow hole 31.

With reference to Figs 1, 7 and 8, the head section 5 of the femur fixture 1 has a collar section 20 and a tapered mounting section 23 for the ball component 25 of the hip-joint prosthesis to be mounted on. The mounting section 23 is provided with a recess 24 for reception of the ball component 25. The collar section 20 delimits the insertion of the intraosseous anchoring section 3 into the bore in the femur neck by abutting with the resected femur section 33 adjacent the opening to the cavity 30. As can be seen in Fig. 5, the distal surface 21 (Fig. 5) is inclined inwardly for mating with a correspondingly inclined bone surface the resected femur section 33 (Fig. 7). The angle of inclination in the embodiment herein described is approximately 15°. Further, as seen in Fig. 6, for improved anchorage and osseointegration, the distal surface 21 of the collar section 20 is provided with radially spaced, circumferential beads 22, said beads having a height of approximately 0.3 mm.

The surgical procedures described in WO93/16663 and WO97/25939 for implanting the femur fixtures disclosed therein can also be adapted for implantation of the femur

fixture 1 and as such are incorporated herein by reference.

The anchorage of the femur fixture 1 is primarily reliant on the registration of the threads in the bone of the femur, principally the registration of the threads on the proximal cylindrical section 11 in the cortex 34 of the femur neck and the registration of the threads on the distal cylindrical section 13 in the lateral cortex 34 of the femur. This is in distinction to femur fixtures which rely on a thrust plate mechanism for their fixation, for example as in GB-A-2033755.

The femur fixture 1 herein described with reference to the accompanying figures can be varied in numerous ways within the scope of the invention. For instance, the femur fixture 1 could be in the form of an assembly in which the component parts are assembled (i) for insertion thereof laterally into the bore as a one-piece structure, as disclosed in WO93/16663, or (ii) by connecting the parts together in the bore, as disclosed in WO93/01769. The femur fixture 1 could also be made from any biocompatible material of strength sufficient to withstand the loads imposed upon it in situ.

It will be appreciated that the invention has been described with reference to an exemplary embodiment and that the invention can be varied in many different ways within the scope of the appended claims. For instance, the implant is not confined to use as a femur fixture for a hip-joint prosthesis. As an example, the implant could take the form of a bone fixation screw. It will further be appreciated that the use in the appended claims of reference numerals from the Figures of drawings is for the purposes of illustration and not to be construed as having a limiting effect on the claims.

## CLAIMS

1. An implant (1) for insertion into and permanent anchorage in bone tissue, comprising an intraosseous anchoring structure (3) of a generally circular cross-section, said anchoring structure (3) comprising a first cylindrical section (11) of a first diameter and a second cylindrical section (13) of a second diameter, said second diameter being less than said first diameter, said first and second cylindrical sections (11, 13) each being provided with a screw thread profile, characterised in that said anchoring structure (3) comprises a tapered connecting section (15) provided between and interconnecting said first and second cylindrical sections (11, 13).

2. An implant (1) as claimed in claim 1, wherein the implant is a fixture of an orthopaedic prosthesis(1).

3. An implant (1) as claimed in claim 2, wherein the implant is a femur fixture (1) of a hip-joint prosthesis.

4. An implant (1) as claimed in any one of the preceding claims, wherein said connecting section (15) has a frusto-conical shape.

5. An implant (1) as claimed in claim 4, wherein said connecting section (15) at one end has a base diameter essentially equal to said first diameter of said first cylindrical section (11), and at the other end has a top diameter essentially equal to said second diameter of said second cylindrical section (13).

6. An implant (1) as claimed in claim 4 or 5, wherein said connecting section (15) has a flank angle in the range of 10°-50°, preferably in the range of 20°-40°.

7. An implant (1) as claimed in any one of the preceding claims, wherein said connecting section (15) is at least partly provided with a roughened surface.

8. An implant (1) as claimed in claim 7, wherein said roughened surface is at least partly a blasted surface, preferably a grit-blasted surface.

9. An implant (1) as claimed in claim 7 or 8, wherein said roughened surface is at least partly provided with a circumferentially oriented roughness.

10. An implant (1) as claimed in claim 9, wherein  
5 said circumferentially oriented roughness is in the form of circumferential beads.

11. An implant (1) as claimed in claim 10, wherein said circumferential beads has a height less than that of the screw thread profiles of said first and second cylindrical sections (11, 13).  
10

12. An implant (1) as claimed in claim 11, wherein the height of said circumferential beads is no greater than 0.3 mm, preferably in the range of 0.1-0.25 mm, and even more preferably approximately 0.2 mm.

13. An implant (1) as claimed in claim 9, wherein  
15 said circumferentially oriented roughness is in the shape of a screw thread profile.

14. An implant (1) as claimed in claim 13, wherein the screw thread profile of said connecting section (15) differs from the screw thread profiles of said first and second cylindrical sections (11, 13).  
20

15. An implant (1) as claimed in claim 14, wherein the screw thread profile of said connecting section (15) has a height less than that of the screw thread profile of said first and second cylindrical sections (11, 13).  
25

16. An implant (1) as claimed in claim 15, wherein the screw thread profile of said connecting section (15) is in the form of microthreads.

17. An implant (1) as claimed in claim 16, wherein  
30 the height of said microthreads is no greater than 0.3 mm, preferably in the range of 0.1-0.25 mm, and even more preferably approximately 0.2 mm.

18. An implant (1) as claimed in claim 13, wherein the heights of the screw thread profiles of said first and second cylindrical sections (11, 13) and said connecting section (15) are essentially the same.  
35

19. An implant (1) as claimed in any one of the preceding claims, wherein said connecting section is at least partly provided with a smooth surface.

20. An implant (1) as claimed in any one of claims 1-7, wherein the entire surface of said connecting section is smooth.

21. An implant (1) as claimed in any one of the preceding claims, wherein one or more self-tapping cutting recesses (14) are provided at least in part on said connecting section (15).

22. An implant (1) as claimed in any one of the preceding claims, wherein said implant (1) comprises a head section (5), and wherein said anchoring structure (3) comprises a tapered proximal section (18) being provided between and interconnecting said first cylindrical section (11) and said head section (5).

23. An implant (1) as claimed in claim 22, wherein said proximal section (18) has a frusto-conical shape.

24. An implant (1) as claimed in claim 23, wherein said proximal section (18) at the end interfacing said first cylindrical section (11) has a diameter essentially equal to said first diameter of said first cylindrical section (11).

25. An implant (1) as claimed in claim 23 or 24, wherein said proximal section (18) has a flank angle in the range of 8°-15°, preferably in the range of 10°-13°, and even more preferably approximately 12°.

26. An implant (1) as claimed in any one of claims 22-25, wherein said proximal section is at least partly provided with a circumferentially oriented roughness.

27. An implant (1) as claimed in claim 26, wherein said circumferentially oriented roughness is in the form of circumferential beads.

28. An implant (1) as claimed in claim 26, wherein said circumferentially oriented roughness is in the form of a screw thread profile.

29. An implant (1) as claimed in claim 27 or 28, wherein the height of said circumferentially oriented roughness is no greater than 0.3 mm, preferably in the range of 0.1-0.25 mm, and even more preferably approximately 0.2 mm.

30. An implant as claimed in any one of claims 22-29, wherein said head section (5) comprises a collar section (20) having a distal surface (21) abutting said anchoring structure (3).

31. An implant (1) as claimed in claim 30, wherein said distal surface (21) is inclined inwardly towards the body of the collar section (20).

32. An implant (1) as claimed in claim 31, wherein said distal surface (21) is inclined inwardly at an inclination angle within the range of 10°-20°, preferably approximately 15°.

33. An implant (1) as claimed in claim 30, wherein said distal surface (21) is concave.

34. An implant (1) as claimed in any one of claims 30-33, wherein said distal surface (21) is provided with radially spaced circular beads (22).

35. An implant (1) as claimed in claim 34, wherein said circular beads have a height in the range of 0.1-0.5 mm, preferably in the range of 0.2-0.4 mm, and even more preferably approximately 0.3 mm.

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization  
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12 April 2001 (12.04.2001)

PCT

(10) International Publication Number  
**WO 01/24737 A1**(51) International Patent Classification<sup>7</sup>: A61F 2/28 // 2/32

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(22) International Filing Date: 6 October 2000 (06.10.2000)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

9903607-1	6 October 1999 (06.10.1999)	SE
9903612-1	6 October 1999 (06.10.1999)	SE

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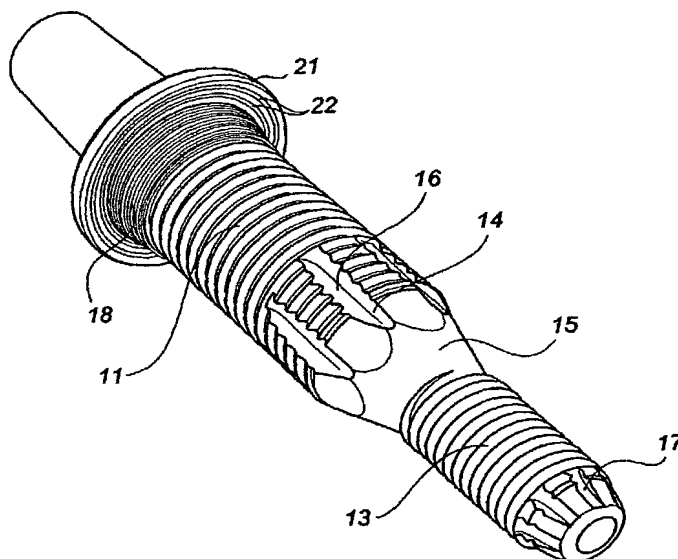
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(81) Designated States (national): AE, AG, AL, AM, AT, AT (utility model), AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, CZ (utility model), DE, DE (utility model), DK, DK (utility model), DM, DZ, EE, EE (utility model), ES, FI, FI (utility model), GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KR (utility model), KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SK (utility model), SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

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[Continued on next page]

(54) Title: IMPLANT



(57) Abstract: An implant (1) for insertion into and permanent anchorage in bone tissue having an intraosseous anchoring structure (3). The anchoring structure (3) has a generally circular cross-section and comprises a first cylindrical section (11) of a first diameter, a second cylindrical section (13) of a second diameter less than the first diameter, said first and second cylindrical sections (11, 13) each being provided with a screw thread profile. The anchoring structure (3) also comprises a tapered connecting section (15) provided between an interconnecting said first and second cylindrical sections (11, 13).

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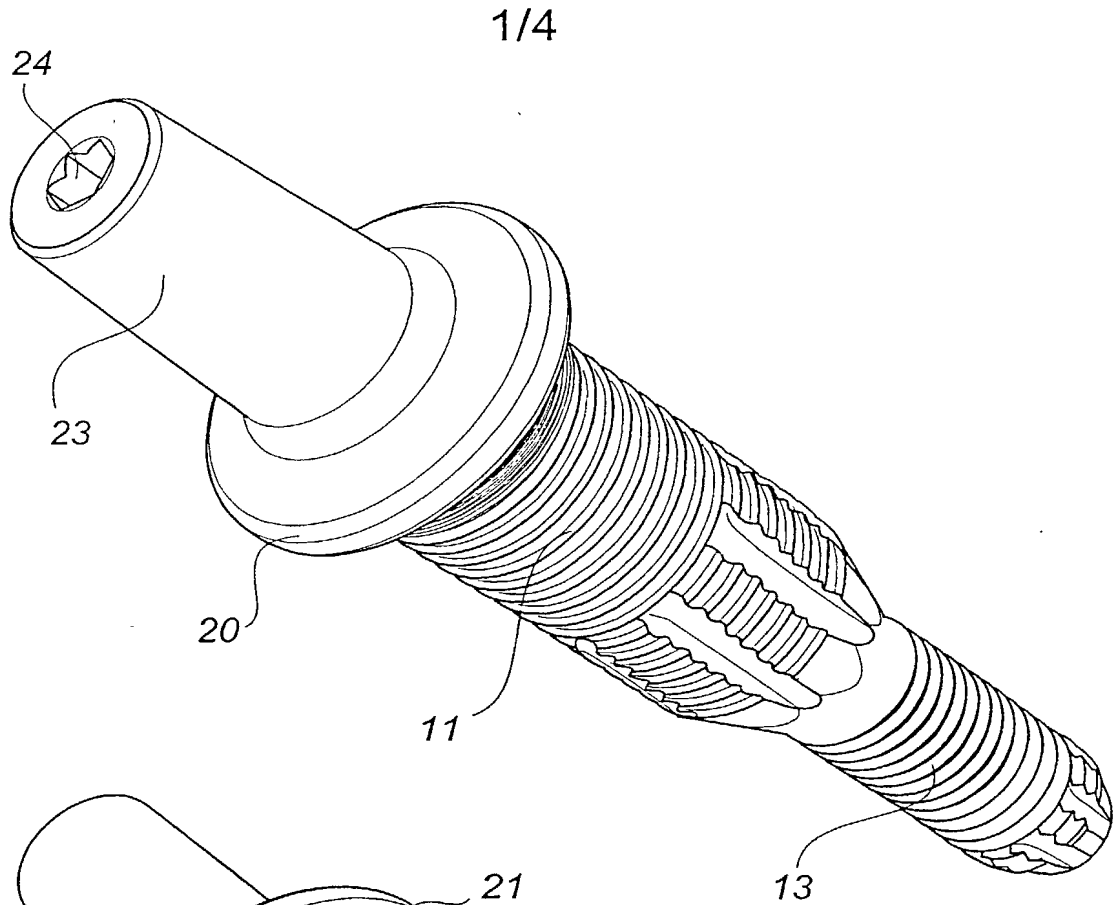


Fig. 1

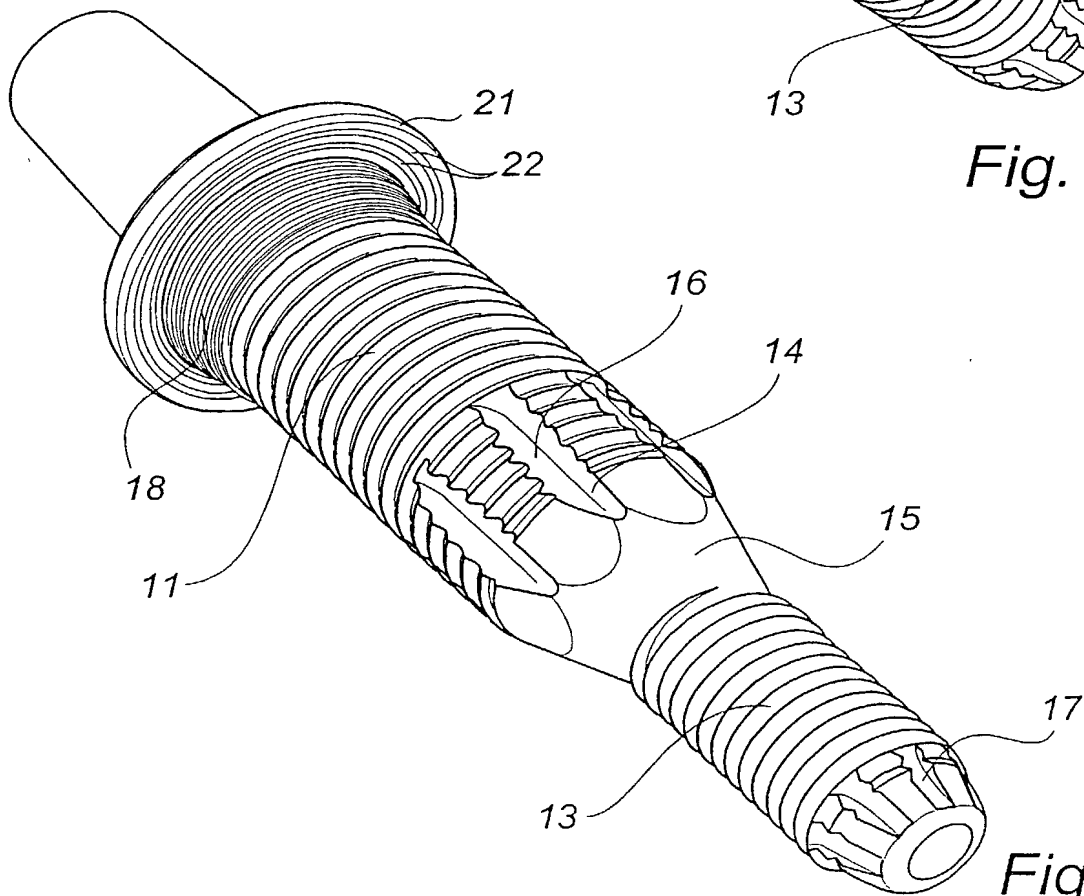
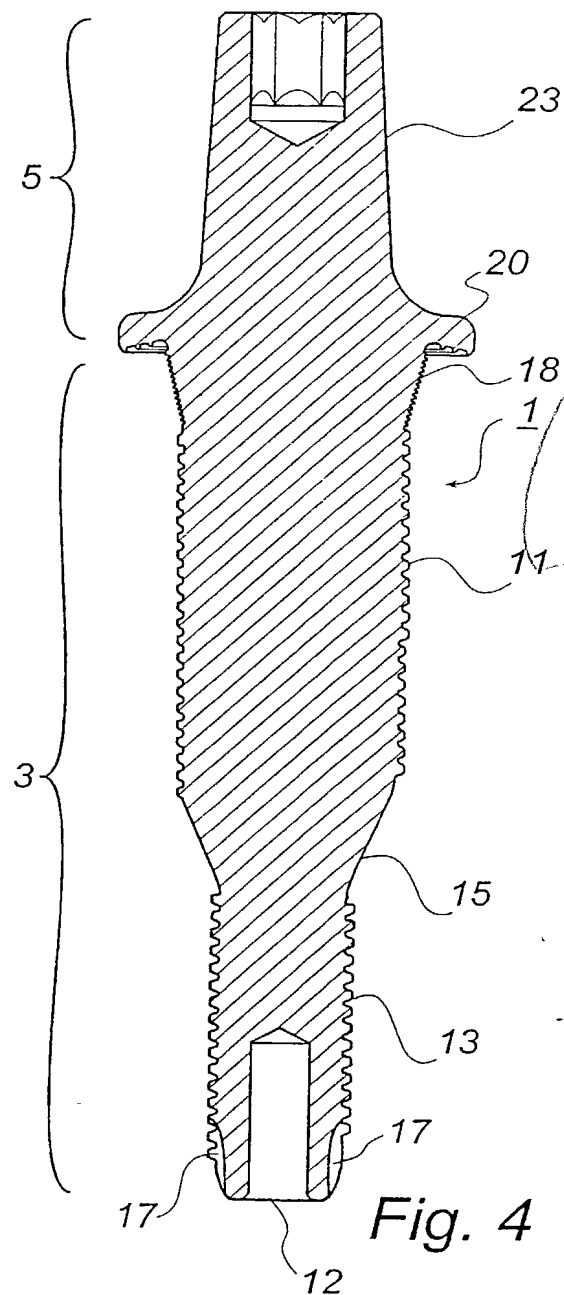
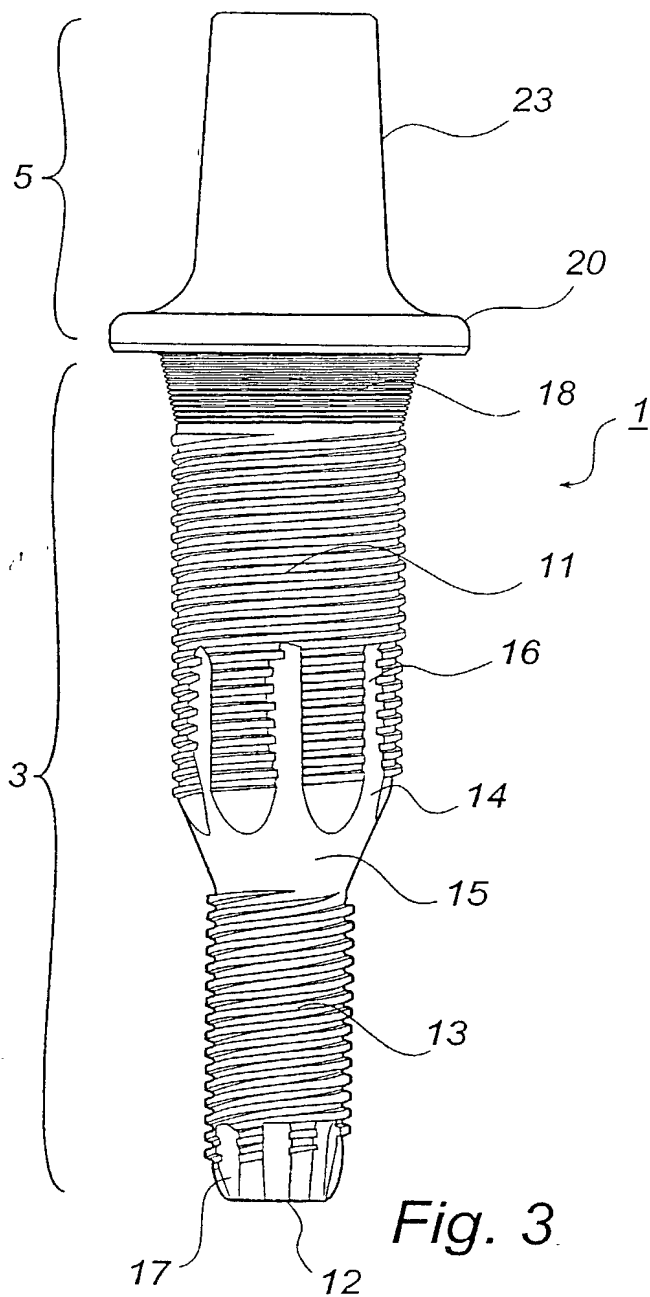


Fig. 2

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3/4

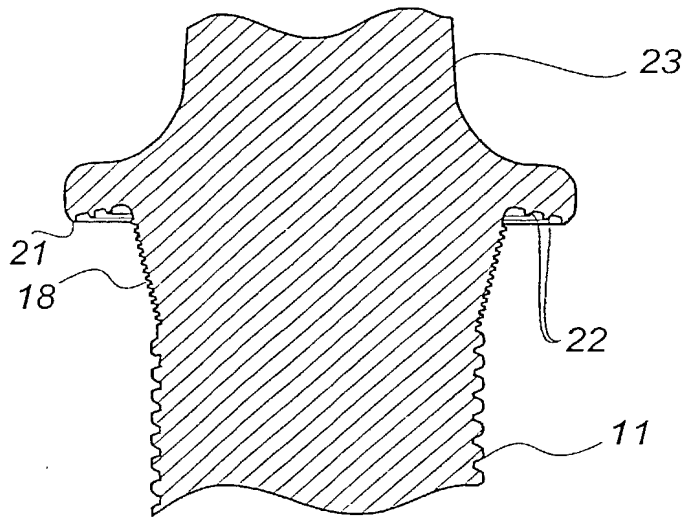


Fig. 5

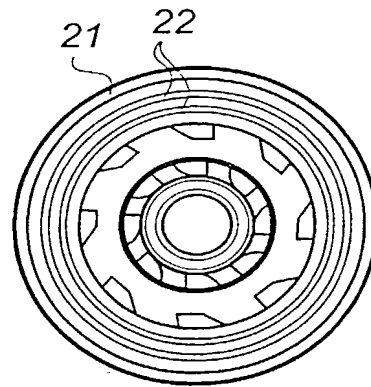


Fig. 6

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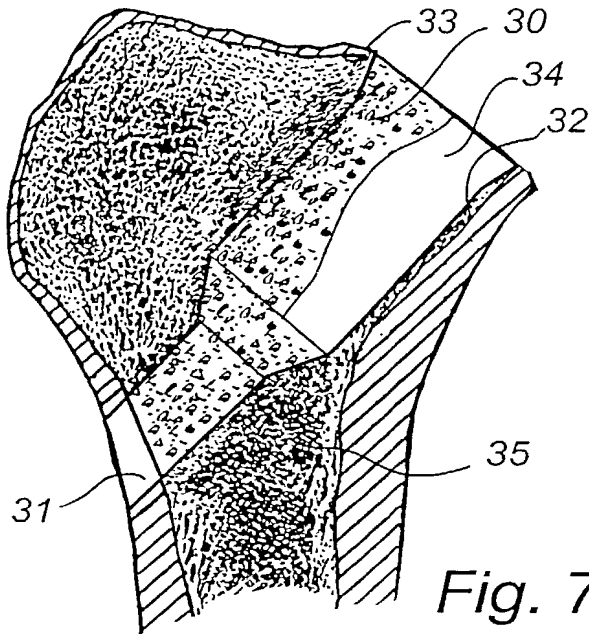


Fig. 7

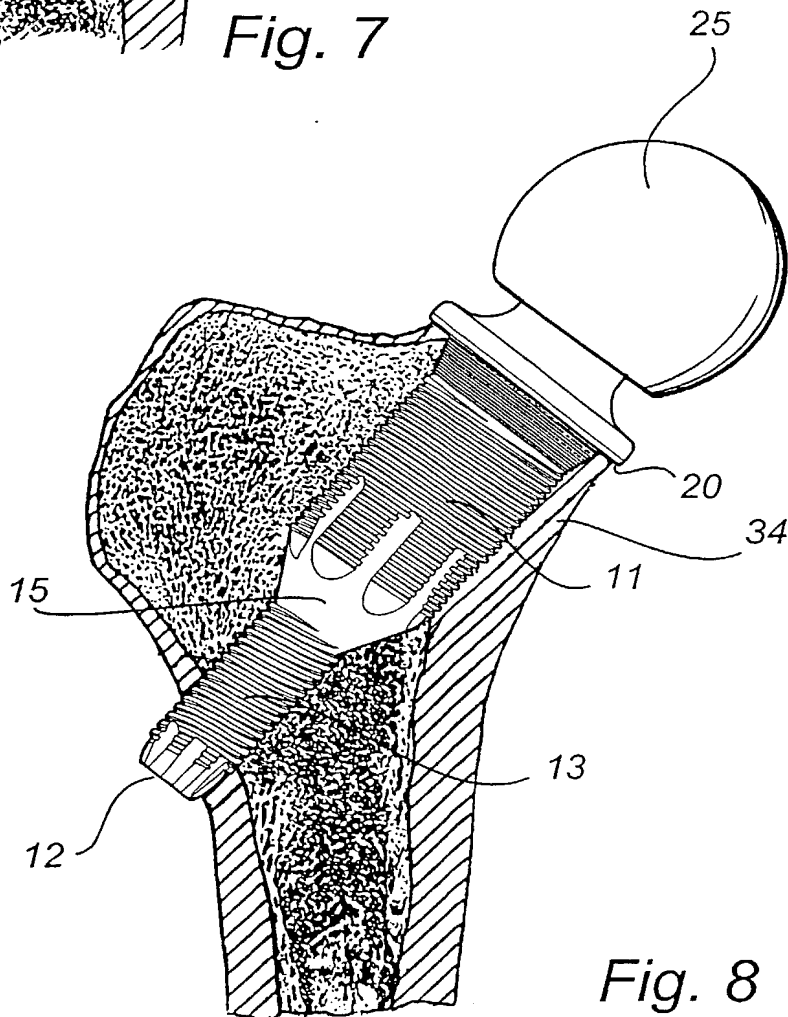


Fig. 8

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 International Application Number PCT/SE00/01944  
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(if appropriate)**Prior Foreign Application(s)****Priority Claimed**

9903612-1	SWEDEN	10/06/1999	<input checked="" type="checkbox"/>	<input type="checkbox"/>
(Number)	(Country)	(Month/Day/Year Filed)	Yes	No
9903607-1	SWEDEN	10/06/1999	<input checked="" type="checkbox"/>	<input type="checkbox"/>
(Number)	(Country)	(Month/Day/Year Filed)	Yes	No
_____	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>
(Number)	(Country)	(Month/Day/Year Filed)	Yes	No
_____	_____	_____	<input type="checkbox"/>	<input type="checkbox"/>
(Number)	(Country)	(Month/Day/Year Filed)	Yes	No

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(Application Number)	(Filing Date)
_____	_____
(Application Number)	(Filing Date)

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(Application Number)	(Filing Date)	(Status - patented, pending, abandoned)
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(Application Number)	(Filing Date)	(Status - patented, pending, abandoned)

Attorney Docket No. 0104-0390P

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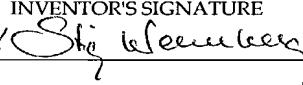
Full Name of Third  
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